Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1.-39. (Canceled).

Claim 40. (Original) A graded core/shell semiconductor nanorod comprising:

at least a first segment comprising:

a core comprising a Group II-VI, Group III-V or a Group IV semiconductor, a graded shell overlying the core,

wherein the graded shell comprises at least two monolayers,

wherein the at least two monolayers each independently comprise a Group II-VI, Group III-V or a Group IV semiconductor.

Claim 41. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:

the graded shell has at least three monolayers, and

the monolayer closest to the core comprises a first semiconductor material, and

the outermost monolayer comprises a second semiconductor material, wherein between the monolayer closest to the core and the outermost monolayer there exists a concentration gradient of the first and second semiconductor material.

Claim 42. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein: the number of monolayers is between two and eight.

Claim 43. (Original) The graded core/shell semiconductor nanorod of claim 42, wherein: the number of monolayer is between 2 and 6.

Claim 44. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein: there is a tail extending longitudinally from the core.

Claim 45. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:

the core comprises CdSe and the graded core/shell comprises CdS/ZnS.

Claim 46. (Original) The graded core/shell semiconductor nanorod of claim 40, wherein:

there is joined to the first segment a second segment comprising:

a core comprising a Group II-VI, Group III-V or a Group IV semiconductor,

a graded shell overlying the core,

wherein the graded shell comprises at least two monolayers,

wherein the at least two monolayers each independently comprise a Group II-VI, Group III-V or a Group IV semiconductor.

Claim 47. (Original) The graded core/shell semiconductor nanorod of claim 46, wherein:

the second segment core comprises CdSe and the second segment graded shell monolayers comprise, in order, CdS/ZnS.

Claim 48. (Original) The graded core/shell semiconductor nanorod of claim 47, wherein:

the first and the second segments have different cross sectional areas.

Claim 49. (Original) The graded core/shell semiconductor nanorod of claim 47, wherein:

there is a third segment joined to the second segment.

Claim 50. (Original) The graded core/shell semiconductor nanorod of claim 49, wherein:

the first, second and third segments have different cross sectional areas.

51. (Canceled).

Claim 52. (Currently Amended) ~~The nanorod barcode of claim 51~~ A nanorod barcode, comprising:

a first segment of a first material; and

a second segment of a second material joined longitudinally to said first segment;

wherein at least one of the first and second segments is configured to generate emission in response to excitation energy, and wherein:

said first and second segments comprise a nanorod core, and

said first and second segment cores independently comprise either a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors or a metal selected from the group consisting of transition metals, oxides and nitrides thereof.

Claim 53. (Original) The nanorod barcode of claim 52, wherein:

said first and second segment cores independently comprise a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors.

Claim 54. (Original) The nanorod barcode of claim 52, wherein:

said first segment core comprises a metal selected from the group consisting of transition metals, oxides and nitrides thereof, and

said second segment comprises a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors.

Claim 55. (Original) The nanorod barcode of claim 52, further comprising:

a third segment connected longitudinally to said first segment core, and

said third segment core comprising a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors.

Claim 56. (Original) The nanorod barcode of claim 55, wherein:

said second and third segments have different cross sectional areas.

Claim 57. (Original) The nanorod barcode of claim 55, wherein:

said first segment core comprises Co, and said second and third segment cores comprise CdSe.

Claim 58. (Original) The nanorod barcode of claim 53, wherein:

said first and second segments have different cross sectional areas.

Claim 59. (Original) The nanorod barcode of claim 58, wherein:

at least one of said first and second segment cores have a graded shell overlying the core.

Claim 60. (Original) The nanorod barcode of claim 58, wherein:

both segment cores have a graded shell overlying said cores.

Claim 61. (Original) The nanorod barcode of claim 53, wherein:

there is a third segment joined longitudinally to said second segment, and

said third segment comprises a semiconductor material selected from the group consisting of Group II-VI, Group III-V and Group IV semiconductors.

Claim 62. (Original) The nanorod barcode of claim 61, wherein:

at least one of said first and second and third segment cores have a graded shell overlying the core.

Claim 63. (Original) The nanorod barcode of claim 62, wherein:

all segment cores have a graded shell overlying the cores.

Claim 64. (Original) The nanorod barcode of claim 55, wherein:

said first, second and third segments have different cross sectional areas.

Claim 65. (Currently Amended) A method of using a nanorod barcode to identify an element, comprising:

labeling at least one identifiable element with at least one nanorod barcode as claimed in claim 52 [[51]].